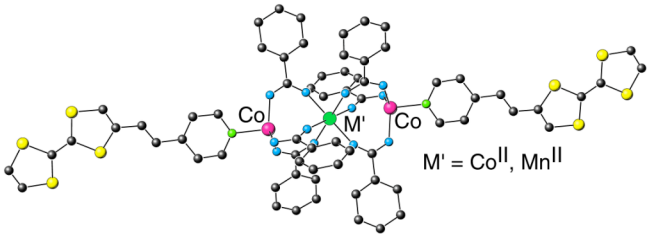
Coordination complexes as a tool for multifunctional molecular materials.

Lahcène Ouahab

Equipe Organométalliques et Matériaux Moléculaires, UMR CNRS 6226 Sciences Chimiques de Rennes, Campus de Beaulieu, 35042 Rennes cedex, France. E-mail : ouahab@univ-rennes1.fr

Development of molecular electronics depends strongly on the development of functional molecules and molecule-based materials. Therefore, current trends in this last field include nanoscience, functional single molecules such as single molecule magnets, single chain magnets and single molecule conductor, and multifunctional materials. In particular, designing molecule-based materials, which possess synergy or interplay between two or more properties such as electrical conductivity with magnetism or spin cross-over, is currently a challenging target and it has been attracting great interests from chemists and physicists for both application to devices or for fundamental science. Preparation of paramagnetic transition metal complexes where the redox active ligands such TTFs are coordinated to spin carrier is a very promising alternative to achieve conducting (or superconducting) magnets through interaction between *d* spins and mobile electrons.[1]



We present in this contribution a new route for the synthesis of homometallic and heterometallic polynuclear transition metal complexes as well as their crystal structures, cyclic voltametry and magnetic properties.[2] The first trinuclear complexes of this kind are shown in the figure and it constitute a first step towards high spin single molecules with redox active ligands

1. L. Ouahab, T. Enoki, *Eur. J. Inorg. Chem.*, 931, (2004)
2. K.S. Gavrilenko, S.V. Punin, O. Cador, S. Golhen, L. Ouahab, V.V. Pavlishchuk, *J. Am. Chem. Soc.*, 127, 12246 (2005).